

WHAT IS CLAIMED IS:

1. An information storage medium wherein upon continuously executing data recording for respective predetermined recording units along a track on said information storage medium, recording can be done to form a gap between the predetermined recording units along the track.
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2. An information recording method wherein upon continuously executing data recording for respective predetermined recording units along a track on an information storage medium, recording is done to form a gap between the predetermined recording units along the track.
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3. An information recording/reproduction apparatus wherein upon continuously executing data recording for respective predetermined recording units along a track on an information storage medium, recording is done to form a gap between the predetermined recording units along the track.
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4. An information storage medium according to claim 1, wherein said medium has a wobbled groove along a spiral track and continuously undergoes data recording for respective predetermined recording units along the track while being rotated,
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- 25 said medium is configured to enable the continuous data recording to form a predetermined gap δ between the predetermined recording units being adjacent along

the track, and

 said predetermined gap δ is configured to satisfy:

$$\delta \geq \tau f$$

where τ is a wobble period of the wobbled groove and f is an allowable rotation nonuniformity of the rotation.

5 5. An information recording method according to claim 2, wherein said method uses an information storage medium which has a wobbled groove along a spiral track and continuously undergoes data recording for respective predetermined recording units along the track while being rotated,

10 wherein upon executing the continuous data recording to form a predetermined gap δ between the predetermined recording units being adjacent along the track,

15 said predetermined gap δ is configured to satisfy:

$$\delta \geq \tau f$$

where τ is a wobble period of the wobbled groove and f is an allowable rotation nonuniformity of the rotation.

20 6. An information recording/reproduction apparatus according to claim 3, wherein said apparatus uses an information storage medium which has a wobbled groove along a spiral track and continuously undergoes data recording for respective predetermined recording units along the track while being rotated, said apparatus comprising:

25 a spindle motor configured to rotate the

information storage medium;

a recording system configured to form a recording mark for the respective predetermined recording units on the track of the information storage medium rotated by the spindle motor; and

5 a reproduction system configured to read information of the recording mark from the information storage medium,

wherein a gap δ , which satisfies:

$$10 \quad \delta \geq \tau f$$

where τ is the wobble period of the wobbled groove and f is the allowable rotation nonuniformity of the spindle motor, is formed between the predetermined recording units being adjacent along the track.

15 7. An information storage medium according to claim 4, wherein the information storage medium is a one-sided, multi-recording layer type disc-shaped medium having a spiral track with a track pitch P_t ,

data recording is optically done on the track with the track pitch P_t via an objective lens having a numerical aperture NA and via an intermediate layer having a refractive index n and thickness t , and

20 a length δ of the gap present between the predetermined recording units satisfies:

$$25 \quad \delta \leq \pi(D + Pt)D/Pt$$

for $D = 2t \tan(\sin^{-1}(NA/n))$.

8. An information recording method according to

claim 5, wherein an information storage medium is a one-sided, multi-recording layer type disc-shaped medium having a spiral track with a track pitch P_t ,

5 data recording is optically done on the tracks with the track pitch P_t via an objective lens having a numerical aperture NA and via an intermediate layer having a refractive index n and thickness t , and

a length δ of the gap present between the predetermined recording units satisfies:

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$$\delta \leq \pi (D + Pt)D/Pt$$

for $D = 2t \tan\{\sin^{-1}(NA/n)\}$.

9. An information recording/reproduction apparatus according to claim 6, wherein an information storage medium is a one-sided, multi-recording layer type disc-shaped medium having a spiral track with a track pitch P_t ,

15 data recording is optically done on the tracks with the track pitch P_t via an objective lens having a numerical aperture NA and via an intermediate layer having a refractive index n and thickness t , and

20 a length δ of the gap present between the predetermined recording units satisfies:

$$\delta \leq \pi (D + Pt)D/Pt$$

for $D = 2t \tan\{\sin^{-1}(NA/n)\}$.

25 10. An information storage medium according to claim 1, wherein upon continuously executing data recording for respective recording units along spiral

tracks on a disc-shaped information storage medium having a center of rotation, recording is done to form a gap between the predetermined recording units along the tracks, and

5 an angular position of the gap formed on one of at least one pair of neighboring tracks of the tracks with respect to the center of rotation is different from an angular position of the gap formed in the other of the neighboring tracks with respect to the center of rotation.

10 11. An information recording method according to claim 2, wherein said method continuously executes data recording for respective recording units along spiral tracks on a disc-shaped information storage medium
15 having a center of rotation to form a gap between the predetermined recording units along the tracks,

20 wherein an angular position of the gap formed on one of at least one pair of neighboring tracks of the tracks with respect to the center of rotation is different from an angular position of the gap formed in the other of the neighboring tracks with respect to the center of rotation.

25 12. An information storage medium according to claim 1, wherein said medium is a recordable information medium on which data recording is continuously done to form a predetermined gap between neighboring predetermined recording units along a

track,

wherein a mark which indicates a recording start position for the continuous data recording for respective predetermined recording units is pre-recorded by a wobble modulation of the track.

5 13. An information recording method wherein an information storage medium cited in claim 12 is used, and after a mark position indicating a recording start position for continuous data recording is detected, continuous recording is started.

10 14. An information recording apparatus wherein an information storage medium cited in claim 12 is used, and after a mark position indicating a recording start position for continuous data recording is detected, continuous recording is started.

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